

place side by side with the last-mentioned species, in the genus *Haptophrya*; and on account of its large size I name it *H. gigantea*.—*Comptes Rendus*, May 5, 1879, p. 921.

*Trichinosis in a Hippopotamus.* By M. E. HECKEL.

M. Heckel describes some observations made by him upon a young Hippopotamus, about two years old, which died on the 10th of May last in the zoological garden of Marseilles, having been received from Egypt about four months before. The animal was in bad health all the time of its residence at Marseilles; and its skin showed an eruption of confluent boils. When removed, the skin showed several lesions in the shape of deep ulcerations, which, having originated around a hair, had attacked the bulb, and thus formed a canal leading generally into a great purulent cavity. Smaller ulcerations led into smaller cavities bounded by a proper membrane, like true cysts, and filled with creamy pus. The examination of a section of the muscular tissue surrounding one of these cysts showed it to contain great numbers of *Trichina*-cysts, resembling those of *Trichina spiralis*, with which also the enclosed worm agreed. The cysts, however, seemed to be much more developed than in the pig or in man.

Upon this curious and interesting fact the author has the following remarks:—"I am ignorant," he says, "what relations may exist between the presence, in the same animal, of *Trichina* and of enormous cysts filled with pus; but the fact indicated by me appears to possess some interest . . . because it seems to prove that the Pachyderms, more than other animals, are exposed to the spontaneous development of this terrible parasite—an important point which may serve to throw some light upon its hitherto unknown migrations. It has been attempted to explain the frequency of the *Trichina* in the pig, by the consideration of the voracity and filthy habits of that animal. The fact to which I now call attention seems to protest against this opinion; for the hippopotamus by no means shares in the mode of existence and the tastes of the pig; and we can hardly suppose that captivity, by the special diet which accompanies it, could have a marked influence upon the development of the Nematoid worm."—*Comptes Rendus*, June 2, 1879, p. 1139.

*On the Apparatus of Sound in some South-American Fishes.*

By M. W. SÖRENSEN.

During my residence, in 1877 and 1878, at the mouth of the Riacho del Oro, in the Rio Paraguay, I was enabled to make some investigations into the mode in which several fishes of these rivers, especially those of the families Siluroidei and Characini, produce peculiar sounds. The swimming-bladder is the principal organ

employed. In the Siluroids the unossified portion of the swimming-bladder is slightly elastic, in a nearly equal manner throughout its whole extent; whilst in the Characini the elasticity depends especially upon flat bands or round cords in the wall. The swimming-bladder acquires its greatest development as an organ of sound in the Siluroids. In the species of the genera *Platystoma* and *Pseudaroides* it is divided by a longitudinal partition and by several transverse partitions into a number of chambers or cells, which, however, freely communicate with each other. In the genus *Doras* the swimming-bladder presents numerous diverticula, divided internally by incomplete septa into a great number of small cells. In all these fishes the transverse apophyses\* of the two or three first vertebræ, and frequently a part of the arch of the first vertebra, are not only bound to each other, but also to the posterior part of the cranium and the apophyses of the first vertebra, by very strong elastic membranes. The transverse apophyses of the second or third vertebra, and sometimes of both these vertebræ, are shaped into the form of very powerful springs †, and closely united to the swimming-bladder. The sound is produced by the action of the muscles which are inserted either directly in the swimming-bladder or upon the transverse apophyses of the third vertebra. In the Characini the elastic parts of the swimming-bladder are stretched in the direction of their length by the contraction of the muscles; and the vibration that results from this rhythmic movement is transmitted to the air contained in the cavity of the swimming-bladder. In the Siluroids the anterior portion of the swimming-bladder is drawn alternately forward and backward by the contraction and relaxation of the muscles. During these movements the air, in passing across the incomplete transverse septa, sets the latter in vibration, and the sound is produced. The height or rather the depth of the sound is in direct proportion to the rapidity of the vibrations of the springs.

The fishes which I have been able to study in this connexion belong to the genera *Ageniosus*, *Doras*, *Platystoma*, *Pseudaroides*, *Prochilodus*, *Chalcinus*, *Pygocentrus*, and *Myletes*; several of them were observed living. None of these fishes respire by means of the swimming-bladder. A memoir containing the details of these observations will appear in the 'Naturhistorisk Tidsskrift' of Copenhagen.—*Comptes Rendus*, May 19, 1879, p. 1042.

\* According to Weber ('De auri et auditu hominis et animalium,' p. 1, Lipsiæ, 1820) these apophyses, in the genus *Silurus* and in the species of the family Cyprinoidei, serve to put the ear in communication with the swimming-bladder. I cannot say whether there is an organ of sound in the latter family, not having yet examined them in this respect.

† According to John Müller ('Archiv für Anat. und Physiologie,' 1842, p. 319), this apparatus, in the genera *Auchenipterus*, *Synodontus*, *Doras*, *Malacopterurus*, and *Euanemus*, assists in locomotion by condensing or rarefying the air in the swimming-bladder. Upon this interpretation M. Moreau, in his excellent memoir on the swimming-bladder (Ann. Sci. Nat. 6<sup>e</sup> sér. iv. Art. no. 8), has already expressed certain doubts, the justice of which I am in a position to prove completely.